

REMARKS/ARGUMENTS

This paper is being provided in response to the Final Office Action dated June 13, 2005 for the above-referenced application. In this response, Applicant has amended Claim 1 to correct a typographical error therein.

The rejection of Claims 1-93 under 35 U.S.C. § 103(a) as being unpatentable over Stevens (U.S. Patent No. 5,949,760, hereinafter referred to as “Stevens”) in view of Bertin (U.S. Patent No. 6,400,681, hereinafter referred to as “Bertin”) in further view of Ardon (U.S. Patent No. 5,751,800, hereinafter referred to as “Ardon”) is hereby traversed and reconsideration thereof is respectfully requested. Applicant respectfully submits that Claims 1-93, as amended herein, are patentable over the cited references, taken separately or in combination. Applicant notes that this rejection is moot as applied to Claims 57 and 68 which were previously cancelled.

Applicant’s Claim 1, as amended herein, recites a method executed on a first data storage device for processing a multipath multihop system call comprising: determining, in accordance with an opcode, whether a data operation request is a multipath multihop system call, said data operation request including a data structure comprising said opcode as a parameter identifying one of a plurality of types of calls; and in response to determining that said data operation request is a multipath multihop system call: determining a communication path between said first data storage device and a target data storage device; determining a first communication connection between said first data storage device and a second data storage device included in the communication path; and sending said data operation request to said second data storage device. Claims 2-21 and 77-82 depend from Claim 1.

Applicant's Claim 22 recites a method for processing a data operation request from a host computer system to a target data storage device comprising: determining a communication path from said host computer system to said target data storage device; sending a data operation request to a first data storage device connected to said host computer system by one of a local area network and a storage area network; determining, at said first data storage system in accordance with an opcode, whether said data operation request is a multipath multihop system call, wherein said data operation request includes a data structure comprising said opcode as a parameter identifying one of a plurality of types of calls; and in response to determining that said data operation request is a multipath multihop system call, forwarding said data operation request to an intermediate data storage device included in said communication path over a communication connection between said first data storage device and said intermediate data storage device. Claims 23-27, 83 and 84 depend from Claim 22.

Applicant's Claim 28 recites a computer system comprising: a host initiating a data operation request; at least three data storage devices, said data operation request being directed to at least one of said at least three storage devices; a communication connection between said host and each of said at least three data storage devices, each of said communication connections including at least one of a storage area network and a local area network; wherein each of said at least three data storage devices includes machine executable code for: receiving and interpreting said data operation request over said communication connection that is one of a local area network and a storage area network; determining, in accordance with an opcode, if said data operation request is a multipath multihop system call, said data operation request including a data structure with said opcode as a parameter identifying one of a plurality of types of calls; and forwarding, in response to determining that said data operation is a multipath multihop system

call, a second portion of said data associated with said data operation request to an other of said at least three data storage devices. Claims 29-33, 85 and 86 depend from Claim 28.

Applicant's Claim 34 recites a data storage device comprising: machine executable code for determining, in accordance with an opcode, whether a data operation request is a multipath multihop system call, said data operation request including a data structure comprising said opcode as a parameter identifying one of a plurality of types of calls; and machine executable code that, in response to determining that said data operation request is a multipath multihop system call: determines a communication path between said data storage device and a target data storage device; determines a first communication connection between said data storage device and a second data storage device included in said communication path; and sends said data operation request to said second data storage device. Claims 35-48, 87 and 88 depend from Claim 34.

Applicant's Claim 49 recites a computer readable storage medium for use in processing a data operation request from a host computer system to a target data storage device comprising: machine executable code for determining a communication path from said host computer system to said target data storage device; machine executable code for sending a data operation request to a first data storage device connected to said host computer system by one of a local area network and a storage area network; machine executable code for determining, at said first data storage system in accordance with an opcode, whether said data operation request is a multipath multihop system call, wherein said data operation request includes a data structure comprising said opcode as a parameter identifying one of a plurality of types of calls; and machine executable code for forwarding said data operation request to an intermediate data storage device

included in said communication path over a communication connection between said first data storage device and said intermediate data storage device in response to determining that said data operation request is a multipath multihop system call. Claims 50-54 and 89 depend from Claim 49.

Applicant's Claim 55 recites a method executed by a data storage entity for routing a communication, the method comprising: determining a type associated with the communication, said communication comprising a data structure including a first parameter identifying said type from one of a plurality of types; determining, at said data storage entity in accordance with said type, whether said communication is a multipath multihop system call to be performed at a target not directly connected to said data storage entity; and in response to determining that said communication is a multipath multihop system call: determining a communication connection between the data storage entity and a connecting data storage entity; and sending said communication to said connecting data storage entity using said communication connection. Claims 56-65, 90 and 92 depend from Claim 55.

Applicant's Claim 66 recites a computer program product for routing a communication by a data storage entity comprising: machine executable code for determining a type associated with the communication, said communication comprising a data structure including a first parameter identifying said type from one of a plurality of types; machine executable code that determines, at said data storage entity in accordance with said type, whether said communication is a multipath multihop system call to be performed at a target not directly connected to said data storage entity; and machine executable code that, in response to determining that said communication is a multipath multihop system call: determines a communication connection

between the data storage entity and a connecting data storage entity; and sends said communication to said connecting data storage entity using said communication connection. Claims 67, 69-76, 91 and 93 depend from Claim 66.

Stevens relates to a method for dynamically assigning communication links between nodes in a multi-hop communication radio network. (Col. 1, Lines 7-9). Stevens discloses establishing simultaneous communications between nodes having neighboring nodes in a multi-hop network of transceiver nodes arranged in neighborhoods by determining the quality of communication links between the nodes of a neighborhood and adjacent neighborhoods. A table of quality data is stored representing the quality of communication links between nodes of the neighborhood for each node. A set of performance criterion of desired service in the neighborhood is stored. Possible link assignments are generated based upon the quality data. Link assignments are allocated between nodes of the neighborhood based on desired performance criterion. (See Abstract; Figure 2; Col. 2, Line 60-Col. 3, Line 55).

Bertin relates to high speed packet switching networks and more particularly to a method and process for minimizing the time to select an optimal routing path between an origin and a destination node in large communication networks. (Col. 1, Lines 6-10). Bertin seeks to minimize the time to establish a connection between an origin and destination node. A path calculated at the time the connection is requested is recorded in a routing database. Alternate paths and new paths may be calculated and stored when the connection set up process is idle. (See Abstract) Bertin discloses that a general problem in the communication networks is to find a path between a source and a destination node. For datagrams, path selection is done for each packet. For virtual circuits, the path decision is done once at time of the connection

establishment. There are a large number of routing techniques described in Bertin's Background including adaptive routine, distributed routing, end to end routing, and connection oriented routing. (Col. 2, Line 20, Col. 3, Line 54). Bertin's Summary of the Invention states that it is an object to his invention to minimize in access nodes the connection set up delay, and in particular, the time to select an optimal path throughout the network between the access node and the destination node. (Col. 5, Lines 48-52). Bertin's Figure 2 is a model of a communication system including a fast packet switching transmission system with eight nodes (201-208). Each network node includes a routing point where incoming data packets are selectively routed on outgoing trunks towards neighboring transit nodes. Such routing decisions are made according to the information in the header of the data packets. (Col. 7, Line 8-Col. 7, Line 29; Figure 2). Bertin discloses a routing controller which calculates the optimum paths through the network that satisfy a given set of quality of services specified by the user and to minimize the amount of network resources used to complete the communication path. (Col. 8, Lines 16-21).

Ardon discloses screening of incoming calls to a subscriber prior to call completion to the subscriber's line, e.g., prior to ringing the subscriber's line. (Col. 1, Lines 6-8). A destination telecommunication switch receives a request to establish a call to a first party served by the switch. The request includes call type data that identifies the party originating the call request as one of a plurality of call categories. A first record associated with the first party is read from a database. The first record includes at least one set of data which defines a call category and a corresponding call processing technique to be utilized for the call category. The switch processes the incoming call in accordance with the predetermined call category handling if the incoming call is identified by call category in the database. (See Abstract; Col. 2, Line 56-Col. 3, Line 2). Ardon further discloses that the call type may be a type of "*7" indicating that the party

originating the call request is a telemarketer (Col. 3, Line 28-Col. 4, Line 43), or a type of “*6” indicating that the party originating the call request is seeking charitable donations. (Col. 4, Line 43- Col. 5, Line 13).

Applicant’s Claim 1, as amended herein, is not disclosed or suggested by the references, taken separately or in combination, in that the references neither disclose nor suggest ***a method executed on a first data storage device for processing a multipath multihop system call comprising: determining, in accordance with an opcode, whether a data operation request is a multipath multihop system call, said data operation request including a data structure comprising said opcode as a parameter identifying one of a plurality of types of calls; and in response to determining that said data operation request is a multipath multihop system call: determining a communication path between said first data storage device and a target data storage device; determining a first communication connection between said first data storage device and a second data storage device included in the communication path; and sending said data operation request to said second data storage device,*** as set forth in Claim 1.

The references of Stevens and Bertin appear silent with regard to any mention of a data operation request including an opcode as a parameter identifying a type of call. Further, Stevens and Bertin neither disclose nor suggest making any determination based on types of calls as identified by an opcode, and also neither disclose nor suggest conditionally performing any processing based on a call type. Additionally, Applicant notes that Steven’s use of the term “multihop” characterizes a type of radio network including nodes and communication links therebetween, and neither discloses nor suggests anything about a type of opcode, system call, or data storage device.

Throughout the Office Action, an analogy is made between “nodes”, as used in both Stevens (see, for example, Page 2) and Bertin (see, for example, page 3), and a “storage device”. Applicant respectfully submits that neither Stevens nor Bertin appear to make any mention or suggestion that the “nodes” of the respective references can be data storage devices. Bertin uses the term “node”, for example, in the background (e.g., Col. 4, Line 66-Col. 7, Line 39) and in the description (e.g., Col. 7, Lines 9-44; Figure 2), where Bertin’s nodes are in a communications network. Stevens discloses a multihop communications radio network in which the “nodes” have associated hardware of a simplex transceiver with an omni-directional antenna. (Col. 2, Lines 9-18). As such, use of the term “nodes” in both Bertin and Stevens make no mention or suggestion of data storage devices.

As pointed out above, Ardon discloses screening incoming telephone calls prior to ringing on the subscriber’s line. Ardon discloses a switch receiving a call request to establish a call to a destination party. The call request includes a call handling type identifying the party originating the request as one of a plurality of call categories. For example, the call handling type may be a “*7” identifying the originating party as a telemarketer, or “*6” identifying a subscriber seeking charitable donations. The switch then processes the incoming call based on the request. Ardon’s call request corresponds to a telephone call request, not a data operation request, as in Applicant’s Claim 1. Ardon discloses the call request being processed by a central office telephone system switch, not a data storage system, as in Applicant’s Claim 1. Ardon discloses the call request including a call handling type identifying the party originating the

request as one of a plurality of call categories, not an opcode used in identifying a multipath multihop system call, as in Applicant's Claim 1.

Applicant respectfully submits that Stevens, Bertin and Ardon appear silent regarding any disclosure or suggestion of a data storage device performing any of the steps as recited in Applicant's Claim 1 for at least the reasons set forth above.

Applicant respectfully submits that one of ordinary skill in the art would not be motivated to combine Stevens, Bertin and Ardon due to the diversity of technical areas as well as problems being solved by each reference. Stevens relates to dynamically assigning communication links between nodes in a multihop communications radio network, Bertin relates to a high speed packet switching network, and Ardon relates to screening telephone calls. In addition to there being no motivation to combine the teachings of these references, Applicant respectfully submits that one of ordinary skill in the art looking to any of these references could not possibly arrive at Applicant's claimed invention since the references all appear silent regarding any mention or suggestion of a data storage device performing any of the steps as recited in Applicant's Claim 1.

For reasons similar to those set forth above regarding Claim 1, Applicant's Claim 22 is not disclosed or suggested by the references, taken separately or in combination, in that the references neither disclose nor suggest at least the features of *a method for processing a data operation request from a host computer system to a target data storage device comprising: ... determining, at said first data storage system in accordance with an opcode, whether said data operation request is a multipath multihop system call, wherein said data operation request includes a data structure comprising said opcode as a parameter identifying one of a plurality*

of types of calls; and in response to determining that said data operation request is a multipath multihop system call, forwarding said data operation request to an intermediate data storage device included in said communication path over a communication connection between said first data storage device and said intermediate data storage device, as set forth in Claim 22.

For reasons similar to those set forth above regarding Claim 1, Applicant's Claim 28 is not disclosed or suggested by the references, taken separately or in combination, in that the references neither disclose nor suggest at least the features of *a computer system comprising: ... at least three data storage devices, said data operation request being directed to at least one of said at least three storage devices; ... wherein each of said at least three data storage devices includes machine executable code for: ... determining, in accordance with an opcode, if said data operation request is a multipath multihop system call, said data operation request including a data structure with said opcode as a parameter identifying one of a plurality of types of calls; and forwarding, in response to determining that said data operation is a multipath multihop system call, a second portion of said data associated with said data operation request to an other of said at least three data storage devices, as set forth in Claim 28.*

For reasons similar to those set forth above regarding Claim 1, Applicant's Claim 34 is not disclosed or suggested by the references, taken separately or in combination, in that the references neither disclose nor suggest *a data storage device comprising: machine executable code for determining, in accordance with an opcode, whether a data operation request is a multipath multihop system call, said data operation request including a data structure comprising said opcode as a parameter identifying one of a plurality of types of calls; and*

machine executable code that, in response to determining that said data operation request is a multipath multihop system call; determines a communication path between said data storage device and a target data storage device; determines a first communication connection between said data storage device and a second data storage device included in said communication path; and sends said data operation request to said second data storage device, as set forth in Claim 34.

For reasons similar to those set forth above regarding Claim 1, Applicant's Claim 49 is not disclosed or suggested by the references, taken separately or in combination, in that the references neither disclose nor suggest at least the features of *a computer readable storage medium for use in processing a data operation request from a host computer system to a target data storage device comprising:... machine executable code for determining, at said first data storage system in accordance with an opcode, whether said data operation request is a multipath multihop system call, wherein said data operation request includes a data structure comprising said opcode as a parameter identifying one of a plurality of types of calls; and machine executable code for forwarding said data operation request to an intermediate data storage device included in said communication path over a communication connection between said first data storage device and said intermediate data storage device in response to determining that said data operation request is a multipath multihop system call, as set forth in Claim 49.*

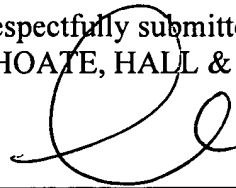
For reasons similar to those set forth above regarding Claim 1, Applicant's Claim 55 is not disclosed or suggested by the references, taken separately or in combination, in that the references neither disclose nor suggest *a method executed by a data storage entity for routing a*

communication, the method comprising: determining a type associated with the communication, said communication comprising a data structure including a first parameter identifying said type from one of a plurality of types; determining, at said data storage entity in accordance with said type, whether said communication is a multipath multihop system call to be performed at a target not directly connected to said data storage entity; and in response to determining that said communication is a multipath multihop system call: determining a communication connection between the data storage entity and a connecting data storage entity; and sending said communication to said connecting data storage entity using said communication connection, as set forth in Claim 55.

For reasons similar to those set forth above regarding Claim 1, Applicant's Claim 66 is not disclosed or suggested by the references, taken separately or in combination, in that the references neither disclose nor suggest *a computer program product for routing a communication by a data storage entity comprising: machine executable code for determining a type associated with the communication, said communication comprising a data structure including a first parameter identifying said type from one of a plurality of types; machine executable code that determines, at said data storage entity in accordance with said type, whether said communication is a multipath multihop system call to be performed at a target not directly connected to said data storage entity; and machine executable code that, in response to determining that said communication is a multipath multihop system call: determines a communication connection between the data storage entity and a connecting data storage entity; and sends said communication to said connecting data storage entity using said communication connection, as set forth in Claim 66.*

Based on the above, Applicant respectfully requests that the Examiner reconsider and withdraw all outstanding rejections and objections. Favorable consideration and allowance are earnestly solicited. Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 617-248-4042.

Respectfully submitted,
CHOATE, HALL & STEWART LLP



Anne E. Saturnelli
Registration No. 41,290

Patent Group
CHOATE, HALL & STEWART LLP
Two International Place
Boston, MA 02110
Tel: (617) 248-5000
Fax: (617) 248-4000

Date: August 26, 2005

3961991v1